

Regarding the rejection of Claims 1-3, 6, 11-15, 18, 23 and 24 under 35 U.S.C. § 112, first paragraph, Applicants respectfully submit that the feature "a thickness of the transfer barrier layer is at least one order of magnitude greater than a thickness of the quantum well" recited in Claims 1 and 13 is supported in the specification at least at page 5, lines 8-10 and 32-34. Applicants note that the specification discloses at page 5, lines 8-10, "there is an order of magnitude between the width of the quantum well  $I_q$  and the width of the transfer barrier  $I_b$ ." Accordingly, it is respectfully requested this rejection be withdrawn.

Claims 1, 2, 3, 11, 13-15 and 23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al in view of Katoh. This rejection is respectfully traversed.

Independent Claims 1 and 13 recite that a thickness of the transfer barrier layer is at least one order of magnitude greater than a thickness of the quantum well.

The Office Action mailed February 2, 2002, at page 7, item 8, states that Rosencher et al show in Figure 4 a transfer barrier having a thickness of 200A and a quantum well layer having a thickness of 80A. Further, the outstanding Office Action states in item 8 that 200A is about one order of magnitude greater than 80A.

Applicants respectfully submit that the definition of "one order of magnitude," as shown for example in Fowler et al, *Concise Oxford Dictionary of Current English*, 9<sup>th</sup> Ed., Clarendon Press, Oxford, p. 960 (1990), is a power of 10 (see Appendix A). Therefore, a quantity about one order of magnitude greater than 80A is about 800A, and consequently 200A is not about one order of magnitude greater than 80A.

Further, Rosencher et al show in Figure 7 a quantum well with a thickness equal to 5 nm and an internal barrier having a thickness equal to 20 nm, which does not satisfy the feature "at least one order of magnitude" recited in Claims 1 and 13.

Accordingly, it is respectfully submitted independent Claims 1 and 13 and each of the claims depending therefrom are allowable.

Claims 6, 12, 18 and 24 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al and Katoh in view of Nanbu. This rejection is respectfully traversed.

Claims 6, 12, 18 and 24 depend either directly or indirectly on independent Claims 1 and 13, which as discussed above are believed to be allowable. Further, Katoh and Nanbu also do not teach or suggest the claimed features. Therefore, it is respectfully requested this rejection also be withdrawn.

Consequently, in light of the above discussion the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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APPENDIX A  
S/N: 09/328,391

# **The Concise Oxford Dictionary of Current English**

*First edited by*

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**Della Thompson**

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## orderly officer

**orderly officer** *n. Brit. Mil.* the officer of the day.

**orderly room** *n. Brit. Mil.* a room in a barracks used for company business.

**order of magnitude** *n.* a class in a system of classification determined by size, usu. by powers of 10.

**Order of Merit** *n.* (in the UK) an order founded in 1902, for distinguished achievement.

**Order of the Bath** *n.* (in the UK) an order of knighthood. [so called from the ceremonial bath which originally preceded installation]

**order of the day** *n.* 1 the prevailing state of things. 2 a principal topic of action or a procedure decided upon. 3 business set down for treatment; a programme.

**Order of the Garter** *n.* the highest order of English knighthood. [so called from the traditional story of the order's founding, that the garter was that of the Countess of Salisbury which Edward III placed on his own leg after it fell off while she was dancing]

**order paper** *n. esp. Parl.* a written or printed order of the day; an agenda.

**ordinal** /'ɔ:dm(ə)/ *n. & adj.* ● *n.* 1 (in full **ordinal number**) a number defining a thing's position in a series, e.g. 'first', 'second', 'third', etc. (cf. **CARDINAL NUMBER**). 2 *Eccl.* a service book, esp. one with the forms of service used at ordinations. ● *adj.* 1 a of or relating to an ordinal number. b defining a thing's position in a series etc. 2 *Biol.* of or concerning an order (see **ORDER** n. 8). [Middle English via Late Latin *ordinalis* from Latin (as **ORDER**: sense 2 of noun from medieval Latin *ordinale* (liber 'book'))]

**ordnance** /'ɔ:dnəns/ *n.* 1 an authoritative order; a decree. 2 an enactment by a local authority. 3 a religious rite. 4 *archaic* = **ORDONNANCE**. [Middle English via Old French *ordenance* and medieval Latin *ordinantia* from Latin *ordinare* **ORDAIN**]

■ **Usage** Care should be taken not to confuse *ordnance* meaning 'a decree' or 'a religious rite' with *ordnance* meaning 'mounted guns' or 'the government service dealing with military stores and materials'. Note also *ordnance* and *Ordnance Survey*.

**ordinand** /'ɔ:dmənd, ɔ:dnənd/ *n. Eccl.* a candidate for ordination. [Latin *ordinandus*, gerundive of *ordinare* **ORDAIN**]

**ordinary** /'ɔ:dm(ə)ri, -d(ə)n-/ *adj. & n.* ● *adj.* 1 a regular, normal, customary, usual (in the *ordinary course of events*). b boring; commonplace (an *ordinary little man*). 2 *Brit. Law* (esp. of a judge) having immediate or ex officio jurisdiction, not deputed. ● *n.* (pl. -ies) 1 *Brit. Law* a person, esp. a judge, having immediate or ex officio jurisdiction. 2 (the **Ordinary**) a an archbishop in a province. b a bishop in a diocese. 3 (usu. **Ordinary**) *RC Ch.* a those parts of a service, esp. the Mass, which do not vary from day to day. b a rule or book laying down the order of divine service. 4 *Heraldry* a charge of the earliest, simplest, and commonest kind (esp. chief, pale, bend, fess, bar, chevron, cross, saltire). 5 (the **Ordinary**) (also **Lord Ordinary**) any of the judges of the Court of Session in Scotland, constituting the Outer House. 6 esp. *US hist.* an early type of bicycle with one large and one very small wheel; a penny-farthing. 7 *Brit. hist.* a a public meal provided at a fixed time and price at an inn etc. b an establishment providing this. □ in *ordinary* *Brit.* by permanent appointment (esp. to the royal household) (physician in *ordinary*). in the *ordinary way* if the circumstances are or were not exceptional. out of the *ordinary* unusual. □ *ordinarily* /'ɔ:dm(ə)(ə)rili, -d(ə)n(ə)rili/ *adv.* *ordinariness* *n.* [Middle English from Latin *ordinarius* 'orderly' (as **ORDER**)]

**ordinary grade** *n.* (in Scotland) the lower of two main levels of examination leading to the Scottish Certificate of Education.

**ordinary level** *n. hist.* (in the UK except Scotland) the lower of the two main levels of the GCE examination.

**ordinary scale** *n.* = **DECIMAL SCALE**.

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**ordinary seaman** *n.* a sailor of the lowest rank; a below-able-bodied seaman.

**ordinary share** *n. Brit.* a share in a company which entitles the holder to a dividend from net profits (cf. **PREFERRED SHARE**).

**ordinate** /'ɔ:dmət/ *n. Math.* a point on a coordinate system, usually a coordinate point drawn parallel to one coordinate axis and perpendicular to the other, usually a coordinate axis (cf. **ABSCISSA**). [Latin *ordinatus* 'line applied parallel', from *ordinare*]

**ordination** /'ɔ:drɪneɪʃ(ə)n/ *n.* 1 a the act of ordaining. 2 the holy orders, esp. on a priest or deacon. 3 the office of a priest etc. to Church ministry. 4 the act of decreeing or ordaining. [Middle English via Old French *ordination* or Latin *ordinatio*]

**ordnance** /'ɔ:dnəns/ *n.* 1 mounted guns. 2 the branch of government service dealing with military stores and materials. [Middle English via Old French *ordenance*]

■ **Usage** See **Usage Note** at **ORDNANCE**.

**ordnance datum** *n. Brit.* mean sea level as determined by the Ordnance Survey.

**Ordnance Survey** *n.* (in the UK) the government organization, originally under the War Office, preparing large-scale maps of the whole country.

**Ordnance Survey map** *n.* (also **OS map**) a map produced by the Ordnance Survey.

**ordnance** /'ɔ:dnəns/ *n.* the system of military stores, esp. of literary or architectural work. [Middle English via Old French *ordenance*; see **ORDNANCE**]

**Ordovician** /'ɔ:dvɪʃ(ə)n/ *adj.* 1 a relating to the second period of the Paleozoic era, evidence of the first vertebrates and marine invertebrates. Cf. **Appendix** 1. b or system. [Ordovices, the Latin name of a British tribe in N. Wales]

**ordure** /'ɔ:djʊə/ *n.* 1 excrement; dirt. 2 a foul language. [Middle English via Old French *ordure*, from Latin *horridus*; see **HORRID**]

**Ore.** *abbr.* Oregon.

**ore** /ɔ:/ *n.* a naturally occurring substance from which metal or other valuable substance can be extracted. [Old English *ora* 'ore', related to Latin *aes* 'copper']

**øre** /'ɔ:ə/ *n.* (pl. same) a Danish monetary unit equal to one hundredth of a krone. [Danish and Norwegian]

**öre** /'ɔ:ə/ *n.* (pl. same) a Swedish monetary unit equal to one hundredth of a krona. [Swedish]

**oread** /'ɔ:riəd/ *n.* (in Greek and Roman mythology) a mountain nymph. [Middle English via Old French *oreade*, from Greek *oreas* 'mountain']

**orectic** /'ɔ:rektɪk/ *adj.* *Philos. & Med.* relating to desire or appetite. [Greek *orektikos* 'reaching out, reaching for']

**Oreg.** *abbr.* Oregon.

**oregano** /'ɔ:riɡəˈnoʊ, ɔ:riɡəˈnɔ:/ *n.* (in the US) wild marjoram used as a culinary herb. [Spanish, = **ORIGANUM**]

**oreography** *var.* of **OROGRAPHY**.

**oreweed** *var.* of **OARWEED**.

**orfe** /'ɔ:f/ *n.* a usu. silvery freshwater fish of the carp family, fished commercially in Eurasia. Also called *ide*. See also **IDE**. [German: perhaps related to *Orpheus*, from Greek *orphos* 'sea-perch']

**organ** /'ɔ:g(ə)n/ *n.* 1 a a usu. large musical instrument having pipes supplied with air from a bellows, and distributed into parts by keys, and distributed into parts of partial organs, each with a separate keyboard. b a smaller organ, producing similar sounds. c a smaller keyboard wind instrument, such as a harmonium. d = **BARREL ORGAN**.

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